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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,664

03/17/2005

Philip Head

23249

3808

535 7590 05/07/2007
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EXAMINER

MULLINS, BURTON S

ART UNIT

PAPER NUMBER

2834

MAIL DATE

DELIVERY MODE

05/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/528,664		HEAD, PHILIP	
	Examiner		Art Unit	
	Burton S. Mullins		2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12-15 17-20, 23 and 24 is/are rejected.
- 7) ☒ Claim(s) 10, 11, 21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claim 16 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species (rotatable shaft outside stator), there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 27 February 2007.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

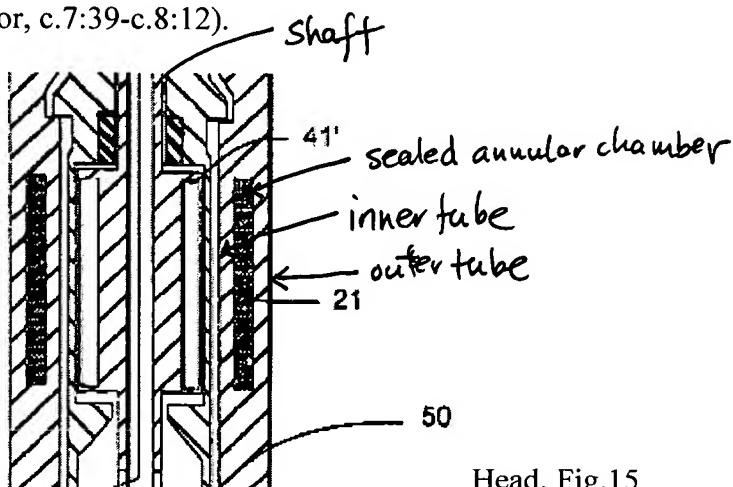
4. Claim 8 is objected to because of the following informalities: "modules" lacks antecedent basis. Presumably this refers to the stators. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8 and 12-14 are rejected under 35 U.S.C. 103(a) as being obvious over Head (US 6,557,642) in view of Mendez (US 5,320,182). Head teaches a brushless dc electric motor for powering downhole tools (Fig.15), the motor comprising: a first stator with conductive windings 21; a shaft (not numbered) centered on and extending along an axis and including a first magnetic element 41' (magnets on rotor circumference); and coaxial inner and outer tubes (not numbered) defining a sealed annular chamber holding the first stators (i.e., stator coil 21), the first magnetic element being aligned with the first stator such that when the winding is energized the stator acts on the magnetic element (i.e., the rotor and stator function as a dc motor, c.7:39-c.8:12).



Head, Fig.15

Head differs only in that the dc permanent magnet motor has only a first stator and rotor, not a second stator and rotor.

Mendez teaches a downhole pump including plural dc motors 60a-60d mounted serially in axially stacked relation, each with stator 62a-62d and permanent magnet rotor (not shown, Fig.1B, c.5:12-27) so as to generate sufficient power to drive the pump to produce a desired flow rate and overcome pressure differentials (c.1:36-43 & 51-65)

It would have been obvious to incorporate plural motors per Mendez into the downhole tool of Head to generate sufficient power to drive the pump to produce a desired flow rate and overcome pressure differentials.

Regarding claim 2, the conductive windings of Mendez comprise a first set of coil windings disposed in the first stator and a second set of coil windings disposed in the second stator.

Regarding claim 3, Mendez teaches “more than two stators...and a corresponding number of magnetic elements” and the stators of Mendez would be located in the annular cavity of Head in the combination.

Regarding claim 4, methods of manufacture, i.e. the step of “secured by swaging” are not given weight in apparatus claims. Head teaches the inner tube disposed in the outer tube.

Regarding claims 5-6, Mendez’s multiple motors comprise plural, separately formed shafts secured together in series by couplers 70 (c.3:53-59; Fig.1B). Further, the first shaft element is disposed within the first stator 62a, and a second shaft element is disposed within the second stator 62b.

Regarding claim 7, methods of manufacture are not given weight in apparatus claims. Further, to provide separate outer tube elements would have been obvious since it has been held that separation of parts, e.g. separation of Head's outer tube, into plural parts involves ordinary skill. *Nerwin v. Erlichman* 168 USPQ 177 (1969).

Regarding claim 8, as best understood, the outer tube in Head is secured to the stator. In the combination, the outer tube would be secured to the multiple stators of Mendez. Methods of manufacture are not given patentable weight in apparatus claims.

Regarding claim 12, in Head Fig.3, a power cable comprising a connection of the windings to the power supply is enclosed in the sealed chamber since the power cable terminates at one or more docking ports 20 which contain the stator coils 21 (c.4:53-56).

Regarding claim 13, the rotors of Head and Mendez each drive pumps.

Regarding claim 14, in Head the inner tube forms an internal bore for passage of well fluids (c.7:40-41; Figs.14-15).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Head and Mendez as applied to claim 1 above, and further in view of Luenberger (US 3,135,884). The combination of Head and Mendez does not teach that the second tube is made from a non-magnetizable material.

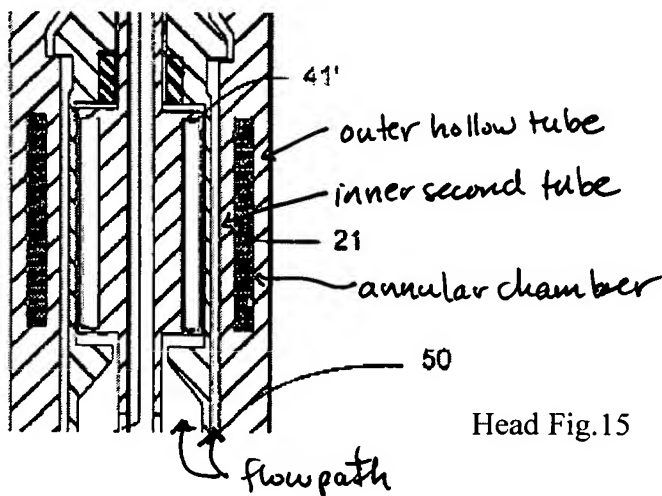
Luenberger teaches submersible pump motor including an inner tube or sleeve 15 made of plastic such as Teflon disposed within the bore of the lamination stack 2 so as to seal the outer stator (c.1:72-c.2:6).

It would have been obvious to modify Head and Mendez and provide a nonmagnetizable material such as Teflon for the second, inner tube per Luenberger so as to seal the stator.

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8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Head (US 6,557,642) in view of Eno et al. (US 5,923,111). Head teaches an electric motor suitable for installing in a borehole for powering downhole tools comprising a stator including a first set of coil windings 21; a rotatable shaft including a magnetic element (magnets) 41' (Fig.15); an outer hollow tube (not numbered, see Fig.15 below), and an inner second tube (not numbered) concentrically inside the outer tube together defining an annular chamber (in which stator windings 21 reside), the inner tube defining a flowpath (not numbered, see Fig.15 below), the stator being located in the annular chamber, the rotatable shaft being at least partially tubular (the shaft is inherently tubular).

Head does not teach that the magnetic element (magnet) 41' is "at least partially tubular".



Eno teaches a modular permanent magnet motor for submersible pumps including a rotor comprising a plurality of arcuate (i.e., "partially tubular") magnets 64 (Fig.5) disposed about and attached to rotor core 62 (c.3:65-67; c.4:41-52). The arcuate magnets are configured to facilitate rotation of the rotor modules during energization or de-energization of the coils 80.

It would have been obvious to modify Head and provide partially tubular magnets per Eno to allow for a rotor configuration that facilitates rotation during energization or de-energization of the coils.

9. Claims 17-19 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Head and Eno as applied to claim 15 above, and further in view of Mendez. Neither Head nor Eno teach more than two stators located in the annular cavity, and a corresponding number of magnetic elements.

Mendez teaches a downhole pump including plural dc motors 60a-60d mounted serially in axially stacked relation, each with stator 62a-62d and permanent magnet rotor (not shown, Fig.1B, c.5:12-27) so as to generate sufficient power to drive the pump to produce a desired flow rate and overcome pressure differentials (c.1:36-43 & 51-65)

It would have been obvious to incorporate plural motors per Mendez into the downhole tool of Head and Eno to generate sufficient power to drive the pump to produce a desired flow rate and overcome pressure differentials.

Regarding claim 18, methods of manufacture, i.e. the step of “secured by swaging” are not given weight in apparatus claims. Head teaches the second (inner) tube disposed in the outer tube.

Regarding claim 19, Mendez’s multiple motors comprise plural, separately formed shafts secured together in series by couplers 70 (c.3:53-59; Fig.1B), thereby coupling the rotors of the plural motors in a configuration that generates sufficient power to drive the pump.

Regarding claim 23, in Head Fig.3, a power cable comprising a connection of the windings to the power supply is enclosed in the sealed chamber since the power cable terminates at one or more docking ports 20 which contain the stator coils 21 (c.4:53-56).

Regarding claim 24, the rotors in each of Head, Eno and Mendez are connected to respective pumps.

10. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Head, Eno and Mendez and as applied to claim 15 above, and further in view of Luenberger (US 3,135,884). The combination of Head, Eno and Mendez does not teach that the second tube is made from a non-magnetizable material.

Luenberger teaches submersible pump motor including an inner tube or sleeve 15 made of plastic such as Teflon disposed within the bore of the lamination stack 2 so as to seal the outer stator (c.1:72-c.2:6).

It would have been obvious to modify Head, Eno and Mendez and provide a nonmagnetizable material such as Teflon for the second, inner tube per Luenberger so as to seal the stator.

Allowable Subject Matter

11. Claims 10-11 and 21-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach that the chamber includes a pressure compensation means (claims 10 and 21).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029.

The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
01 May 2007